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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,528	01/27/2004	Hideyuki Kazumi	056204.53113US	9560

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EXAMINER	
ALEJANDRO MULERO, LUZ L	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/764,528	KAZUMI ET AL.	
	Examiner	Art Unit	
	Luz L. Alejandro	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0104*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii, U.S. Patent 5,571,366 in view of Masuda et al., US 2004/0045675 and Nakajima et al., US 2002/0139480.

Ishii shows the invention substantially as claimed including a plasma processing apparatus comprising: a vacuum reactor 2 having processing gas introduction means and evacuation means; a specimen placing device having an antenna electrode 63 for radiating high frequency power into the vacuum reactor, wherein first high frequency power is supplied to the antenna electrode, and an exciting coil 6 formed on an outer circumference of an outer circumferential wall of the vacuum reactor (see fig. 9 and its description).

Ishii does not expressly disclose a shield electrode formed on an outer circumferential wall of the vacuum reactor and where high frequency power at a frequency lower than that of the first high frequency power is supplied to the antenna electrode and shield electrode.

Masuda et al. discloses an antenna electrode having a first RF power supply 121 at a high frequency and a RF power supply 122 at a frequency lower than the first RF

power supply (see fig. 1 and paragraph 0051). Furthermore, Nakajima et al. discloses a shield electrode 217 and impedance element 452 with an RF power supply 458 with a high frequency but lower than the frequency supplied to the coil (see fig. 9A and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ishii so as to include the claimed antenna/shield electrode configuration as suggested by Masuda et al. and Nakajima et al. because in such a way the operation of the inductively coupled apparatus is optimized and undesired sputtering on the dielectric window can be reduced.

With respect to claims 3-4, note that the apparatus of Ishii modified by Masuda et al. and Nakajima et al. includes a slit formed at a portion of the shield electrode, facing the coil in a direction substantially perpendicular to the exciting coil, and an opening is formed at a central portion of the shield electrode on an upper surface of the vacuum reactor.

Concerning the disk-shaped cavity or disk-shaped dielectric layer, Ishii et al. discloses a dielectric layer 62 over the antenna electrode. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimum diameter of the disk-shaped cavity or disk-shaped dielectric layer depending upon a variety of factors including, for example, the anticipated amount of wear of the window and such limitation would not lend patentability to the instant invention absent a showing of unexpected results. Regarding the shape of the cavity or layer, the configuration of the claimed cavity or layer is a

matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed cavity or layer is significant.

Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii, U.S. Patent 5,571,366 in view of Masuda et al., US 2004/0045675 and Nakajima et al., US 2002/0139480 as applied to claims 1-4 above, and further in view of Ye et al., U.S. Patent 5,710,486.

Ishii, Masuda, and Nakajima et al. are applied as above but do not expressly disclose the antenna electrode and the shield electrode or the exciting coil connected by way of a power divider or a phase shifter.

Ye discloses conductive elements such as electrodes and coils by way of power dividers and capacitors which can be used as phase shifters (see figs. 8-9 and their description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ishii modified by Masuda and Nakajima et al. so as to include power dividers and phase shifters in the claimed arrangement because in such a way the total number of power sources will be reduced.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii, U.S. Patent 5,571,366 in view of Masuda et al., US 2004/0045675 and Nakajima et al.,

US 2002/0139480 as applied to claims 1-4 above, and further in view of Steger et al., U.S. Patent 5,788,799.

Ishii, Masuda et al., and Nakajima et al. are applied as above but do not expressly disclose a zirconium oxide film formed on an inner wall surface of the vacuum reactor. Steger et al. discloses a zirconium oxide film 102 formed on an inner wall surface of the vacuum reactor which can be composed of ceramics which are commonly dielectrics (see fig. 1 and its description and col. 5-lines 33-40). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ishii modified by Masuda et al. and Nakajima et al. so as to include a zirconium oxide liner because in such a way the inner walls of the chamber will be protected.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii, U.S. Patent 5,571,366 in view of Masuda et al., US 2004/0045675 and Nakajima et al., US 2002/0139480 as applied to claims 1-4 above, and further in view of Otsuki, US 2001/0003271.

Ishii, Masuda et al., and Nakajima et al. are applied as above but do not expressly disclose a yittrium oxide film on an inner wall surface of the vacuum reactor. Otsuki discsloses a yittrium oxide film 14 on an inner wall surface of a vacuum reactor (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Ishii modified by Masuda et al. and Nakajima et al. so as to form a yittrium

oxide film on the inner walls of the vacuum reactor because this will provide a high corrosion resistance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luz L. Alejandro
Primary Examiner
Art Unit 1763

November 28, 2005